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## ABSTRACT OF THE INVENTION

A sensor system utilizing a Composite Hough Transform (CHT) operates on multiple

corresponding broadband correlograms produced at two neighboring dual-channel sensor systems.

10    A broadband signal source can generate one correlation trace on each of the correlograms. Since

these correlation traces are produced by the same signal source, they are constrained by a set of

geometric relationships. By fully exploiting this set of constraints, the CHT fuses sensor data

from multiple dual-channel sensor systems for target detection and track parameter estimation.

The dual-channel system can be (a) a split-array system; a linear array split into two subarrays

15    with each subarray corresponding to one of the channels, (b) two neighboring linear arrays, or (c0

two neighboring individual hydrophones. The CHT operates with two neighboring linear

subarrays. One of the sensor arrays is chosen as the primary array; it is used to originate the

different track hypotheses for the signal source. Its corresponding broadband correlogram is

referred to as the primary correlogram. The other sensor array is the secondary array, and the

20    corresponding broadband correlogram is referred to as the secondary correlogram. The CHT

exploits the geometric relationships between the primary and secondary array.

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